United States Department of Agriculture

Agricultural Marketing Service

Fruit and Vegetable Division

Processed Products Branch

Canned Celery

Grading Manual

This manual is designed for Processed Products Branch personnel of the U.S. Department of Agriculture. Its purpose is to give background information and guidelines to assist in the uniform application and interpretation of U.S. grade standards, other similar specifications and special procedures.

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Canned Celery
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FLAVOR AND ODOR

Processed (canned) celery with normal flavor and odor should be assigned Grade A. Processed celery packed without the addition of sodium salt is to be evaluated on the basis of the flavor and odor of the celery and packing ingredients only. Normal flavor and odor means a typical characteristic flavor and odor of young, tender, succulent and properly processed celery regardless of the omission or sufficient inclusion of sodium salt in the process. The product shall be free from objectionable flavor and odor of any kind.

Processed celery having an off-flavor and odor, but is edible, is given a Substandard grade. Off-flavor and odor includes, but is not limited to, excessive salt, "flat sour," or any other condition that does not render the product inedible. "Flat sour" in processed celery is identified by a flavor and odor which is definitely acrid. Do not confuse this with the normal acidic and tart flavor of canned salad celery which is acidified. It is normal for canned salad celery to have a "bitey" taste as long as it is not objectionable. Also, be alert for flavor and odor which is caused by de-tinning.

STYLES

A lot of processed celery is designated as the style that it is offered for.

The Federal Food and Drug Administration (FDA) has a standard of identity for canned celery(21 CFR 155.200). The styles of canned celery most commonly marketed are: "sliced" (or "cut"), "diced," and "chopped."

SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER ON-LINE GRADING

SLICED OR CUT STYLE

1. Select at random 900 g (31.7 oz) or one container of canned celery from the processing line. This sample unit should be taken prior to the addition of any packing medium. Also, see option in step 15 of this procedure.

2. Evaluate varietal characteristics. Varietal characteristics mean the appearance, stalk characteristics and any other indicator of the variety of celery. The celery must be of similar varietal characteristics to be grade A.

3. Tentatively assign a score point for the factor of "brightness" which will later be verified after complete processing (See step 10 of this procedure). Brightness means the extent that the overall appearance or eating quality of the mass of canned celery is affected by dullness from improper processing or any other cause. Canned celery which has a good characteristic bright appearance typical of the type of pack (canned salad or canned cooked) may be assigned a score of 18 to 20 points for U.S. Grade A. Canned celery which has a reasonably good characteristic bright appearance typical of the type of pack may be assigned a score of 16 or 17 points for U.S. Grade B. Canned celery that fails to meet the brightness requirements for U.S. Grade B may be assigned a score of 0 to 15 points for Substandard.

4. Evaluate the color of the celery as a mass. Although this is a preliminary check on the factor of color the final check is made on the cooked sample (See step 8 of this procedure). "Good color" means canned celery color which is uniform in the range between green to white units. "Reasonably good color" means canned celery color which lacks uniformity in the range between green to white units. Referring to Table I in the standard assign the proper score for the factor of color.

5. Evaluate the sample unit for "defects." Blemishes, basal portions, extraneous vegetable material, celery leaf material and units affected by mechanical damage are considered defects. Refer to Table I in the standard for the proper assignment of score points for the factor of defects.

6. The sample unit is then evaluated for the factor of "character." For grading purposes character is construed to mean uniformity of texture of the celery units and the degree of freedom from coarseness, stringiness or toughness. The factor of character

(See next page)

SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER ON-LINE GRADING

SLICED OR CUT STYLE (continuation)

6. Character (continuation)

   of canned celery is judged upon completion of processing. Tentatively assign a score point; however, this tentative grade will have to be verified after complete processing (See step 9 of this procedure).

7. Randomly select 900 g (31.7 oz) or one (1) container from each production code. This sample unit is to be selected after the celery has gone through the cooker and cooler.

8. Open the can(s) and place the celery on a grading tray. Verify the tentative grade that was assigned earlier for the factor of color on the line. Make adjustment(s) as necessary.

9. Verify the tentative score point that was assigned earlier for the factor of character on the line. As one might expect, character can be the most troublesome of the grading factors. For canned salad celery, "good character" means celery which is uniform in texture and is practically free from coarse, stringy, or tough units. The celery units must be crisp and firm. Canned salad celery which has a good character may be assigned a score of 27 to 30 points. "Reasonably good" character in canned salad celery means celery which lacks crispness and firmness but is reasonably uniform in texture. The celery is reasonably free from coarse, stringy, or tough units. Canned salad celery which has a reasonably good character may be assigned a score of 24 to 26 points.

   For canned cooked celery, "good character" means celery which is uniform in texture, practically free from coarse, stringy, or tough units and is pliable and tender but not soft. Canned cooked celery that has a good character may be assigned a score of 27 to 30 points. "Reasonably good" character in canned cooked celery means celery which lacks uniformity in texture, is reasonably free from coarse, stringy, or tough units, and is lacking pliability and tenderness but not mushy. Canned cooked celery that falls into this classification may be assigned a score of 24 to 26 points. MAKE ANY WARRANTED ADJUSTMENT.

   Canned salad celery or canned cooked celery that fails to meet the requirements for "reasonably good" character may be assigned a score of 0 to 23 points.

SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER ON-LINE GRADING

SLICED OR CUT STYLE (continuation)

10. Verify the "brightness" grade that was previously assigned on on-line grading.

11. Evaluate the celery for flavor and odor. Make flavor allowance for special packs, such as diet packs (packed without the addition of sodium salt). Also, make allowance for salad pack.

12. Evaluate the celery for presence of sand, silt or grit using the following procedure:

    Celery, properly sorted, washed, prepared and processed should be free of sand, silt or grit. However, even in the best of packing practices, sand may be present in minute quantity in the product. Sand and similar material may be most easily detected in the bottom of the container after emptying the contents on the grading tray. Another means of detection for sand is by careful examination of the grading tray. Verification for suspected presence of sand is accomplished by rubbing the surface of the grading tray with a spoon. A "grating" feel or sensation indicates the presence of sand.

    Normally, sand and grit would be noted in organoleptic checks for flavor, but this method cannot be relied upon due to the limited sample size. The recommended sample unit size for checking sand and grit is 900 g.

    a. Place the sample in a No. 8 sieve and immerse in a white bottom pan of water.

    b. Agitate the celery to wash off any adhering sand.

    c. Hold the screen over the white bottom pan to catch the wash water containing any remaining sand while spraying the celery with a fine spray of water.

    d. Allow to settle for 2 minutes or longer if necessary.

    e. Decant 3/4 of the liquid.

    f. Repeat process (steps b through e above) until liquid is fairly clear.

    g. Decant the remaining water, being careful not to disturb the sand and grit that has collected in the corner of the bottom of the pan.

(See next page)

SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER ON-LINE GRADING

SLICED OR CUT STYLE (continuation)

12. Sand and grit (continuation).

    h. Examine for presence of sand or grit:

    Grade A - minute amount that is hardly noticeable.

    Grade B - slight amount that is noticeable but not objectionable.

    Substandard - Objectionably affects appearance or edibility.

13. Resample the production period in question if any cooked verification sample unit drawn in step 7 of this procedure fails the designated grade. Any procedure approved by the Branch for reevaluation of cooked quality factors may be used to accept or reject the production code. If the production code is not resampled it may be failed on the basis of one failing "cooked" quality check.

14. Occasionally, equipment breakdown (seamers, cooker, etc.) causes product deterioration. If the defective product is isolated, separately identified and set aside, do not count it as a portion of the production code that is being run.

15. Optionally, the entire evaluation of the sample unit may be made on the product directly out of the cooker and cooler. This procedure is commonly referred to as "cooler cutting." In this case, follow the same procedure as in LOT GRADING.

SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER ON-LINE GRADING

DICED STYLE; CHOPPED STYLE

1. Select at random 900 g (31.7 oz) or one container of celery from the processing line. This sample unit should be selected prior to the addition of any packing medium (also see option in step 14 of this procedure).

2. Evaluate varietal characteristics. Varietal characteristics mean the appearance, stalk characteristics and any other indicator of the variety of celery. The celery must be of similar varietal characteristics to be grade A.

3. Tentatively assign a score point for the factor of "brightness" which will later be verified after complete processing (see step 9 of this procedure). Brightness means the extent that the overall appearance or eating quality of the mass of canned celery is affected by dullness from improper processing or any other cause. Canned celery which has a good characteristic bright appearance typical of the type of pack (canned salad or canned cooked) may be assigned a score of 18 to 20 points for U.S. Grade A. Canned celery which has a reasonably good characteristic bright appearance typical of the type of pack may be assigned a score of 16 or 17 points for U.S. Grade B. Canned celery that fails to meet the brightness requirements for U.S. Grade B may be assigned a score of 0 to 15 points for Substandard.

4. Using the definitions in the U.S. grade standards and Table I, evaluate the color of the celery as a mass. Assign a tentative score point for this quality factor since the final check is made on the cooked sample. See step 8 of this procedure.

5. Referring to the definitions in the U.S. grade standards and to Table I, evaluate the celery for defects. Mechanical damage does not apply to the style of chopped. Normally, little or no verification check is needed for defects other than light bruises or brown streaks that may tend to lighten up upon completion of processing. Set your sights to these changes when grading on-line.

6. As may be expected, "character" could be the most troublesome of the quality grading factors to evaluate. Using the definitions in the U.S. grade standards and Table I, evaluate "character." While this evaluation is tentative it should be verified later (See step 7 of this procedure).

SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER ON-LINE GRADING

DICED STYLE; CHOPPED STYLE (continuation)

7. Select at random 900 g (31.7 oz) or one (1) container from each production period code. This sample unit is to be selected after the celery has gone through the cooker and cooler. Verify the tentative character score that was assigned earlier on the line. For canned salad celery, "good character" means celery which is uniform in texture and is practically free from coarse, stringy, or tough units. The celery units must be crisp and firm. Canned salad celery which has a good character may be assigned a score of 27 to 30 points for U.S. Grade A. "Reasonably good character" in canned salad celery means celery which lacks crispness and firmness but is reasonably uniform in texture. The celery is reasonably free from coarse, stringy, or tough units. Canned salad celery which has a reasonably good character may be assigned a score of 24 to 26 points for U.S. Grade B.

   For canned cooked celery, "good character" means celery units which are uniform in texture, practically free from coarse, stringy, or tough units, and are pliable and tender but not soft. Canned cooked celery that has a good character may be assigned a score of 27 to 30 points for U.S. Grade A. "Reasonably good character" in canned cooked celery means celery which lacks uniformity in texture, is reasonably free from coarse, stringy, or tough units, and is lacking in pliability and tenderness but not mushy. Canned cooked celery that falls into this classification may be assigned a score of 24 to 26 points for U.S. Grade B. Canned salad celery or canned cooked celery that fails to meet the requirements for reasonably good character may be assigned a score of 0 to 23 points (Substandard).

8. Verify the color score point that was assigned earlier on on-line grading.

9. Verify the brightness score point that was previously assigned on on-line grading.

10. Evaluate the celery for flavor and odor. Make allowance for special packs, such as diet packs (packed without the addition of sodium salt). Also, make allowance for salad pack.

SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER ON-LINE GRADING

DICED STYLE; CHOPPED STYLE - (continuation)

11. Evaluate the celery for presence of sand, silt or grit using the following procedure:

    Celery, properly sorted, washed, prepared and processed should be free of sand, silt or grit. However, even in the best of packing practices, sand may be present in minute quantity in the product. Sand and similar material may be most easily detected in the bottom of the container after emptying the contents on the grading tray. Another means of detection for sand is by careful examination of the grading tray. Verification for suspected presence of sand is accomplished by rubbing the surface of the grading tray with a spoon. A "grating" feel or sensation indicates the presence of sand.

    Normally, sand and grit would be noted in organoleptic checks for flavor, but this method cannot be relied upon due to the limited sample size. The recommended sample unit size for checking sand and grit is 900 g.

    a. Place the sample in a No. 8 sieve and immerse in a white bottom pan of water.

    b. Agitate the celery to wash off any adhering sand.

    c. Hold the screen over the white bottom pan to catch the wash water containing any remaining sand while spraying the celery with a fine spray of water.

    d. Allow to settle for 2 minutes or longer if necessary.

    e. Decant 3/4 of the liquid.

    f. Repeat process (steps b through e above) until liquid is fairly clear.

    g. Decant the remaining water, being careful not to disturb the sand and grit that has collected in the corner of the bottom of the pan.

    h. Examine for presence of sand or grit:

       Grade A - minute amount that is hardly noticeable.

       Grade B - slight amount that is noticeable but not objectionable.

       Sustandard - Objectionably affects appearance or edibility.

SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER ON-LINE GRADING

DICED STYLE; CHOPPED STYLE (continuation)

12. Resample the production period in question if any cooked verification sample unit drawn in step 7 of this procedure fails the designated grade. Any procedure approved by the Branch for reevaluation of cooked quality factors may be used to accept or reject the production period. If the production period is not resampled it may be failed on the basis of one failing "cooked" quality check.

13. Occasionally, equipment breakdown (seamers, cookers, etc.) causes product deterioration. If the defective product is isolated, separately identified and set aside do not count it as a portion of the production code that is being run.

14. Optionally, the entire evaluation of the sample unit may be made on the product directly out of the cooker and cooler. This procedure is commonly referred to as "cooler cutting." In this case, follow the same procedure as in LOT GRADING.

SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER LOT GRADING

SLICED OR CUT STYLE

1. After the nonquality factors have been evaluated (net weight, vacuum, etc.) judge the sample unit (900 g or a container) for similar varietal characteristics. Unless there is a marked difference in varietal characteristics the product should not be downgraded for this factor. Do not be overly critical.

2. Evaluate the sample unit for the factor of brightness. Brightness means the extent that the overall appearance or eating quality of the mass of canned celery is affected by dullness from improper processing or any other cause. Canned celery which has a good characteristic bright appearance typical of the type of pack (canned salad or canned cooked) may be assigned a score of 18 to 20 points for U.S. Grade A. Canned celery which has a reasonably good characteristic bright appearance typical of the type of pack may be assigned a score of 16 or 17 points for U.S. Grade B. Canned celery that fails to meet the brightness requirements for U.S. Grade B may be assigned a score of 0 to 15 points for Substandard.

3. Evaluate the color of the celery as a mass. Refer to the definitions in the U.S. standards and to Table I for proper scoring.

4. Using the definitions in the U.S. standards and Table I, evaluate the sample unit for defects. Blemishes, basal portions, extraneous vegetable material, celery leaf material and units affected by mechanical damage are considered defects.

5. For canned salad celery, "good character" means celery which is uniform in texture and is practically free from coarse, stringy, or tough units. The celery units must be crisp and firm. Canned salad celery which has a good character may be assigned a score of 27 to 30 points for U.S. Grade A. "Reasonably good character" in canned salad celery means celery which lacks crispness and firmness but is reasonably uniform in texture. The celery is reasonably free from coarse, stringy, or tough units. Canned salad celery which has a reasonably good character may be assigned a score of 24 to 26 points for U.S. Grade B.

   For canned cooked celery, "good character" means celery which is uniform in texture, practically free from coarse, stringy, or tough units and is pliable and tender but not soft. Canned cooked celery that has a good character may be assigned a score

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SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER LOT GRADING

SLICED OR CUT STYLE (continuation)

5. Character (continuation)

of 27 to 30 points for U.S. Grade A. "Reasonably good character" in canned cooked celery means celery which lacks uniformity in texture, is reasonably free from coarse, stringy, or tough units and is lacking in pliability and tenderness but not mushy. Canned cooked celery that falls into this classification may be assigned a score of 24 to 26 points for U.S. Grade B.

Canned salad celery and canned cooked celery that fails to meet the requirements for reasonably good character may be assigned a score of 0 to 23 points (Substandard).

6. Evaluate the celery for flavor and odor. Make allowance for special packs, such as diet packs (packed without the addition of sodium salt). Also, be alert for off-flavor due to de-tinning.

7. Evaluate the celery for presence of sand, silt or grit using the following procedure:

Celery, properly sorted, washed, prepared and processed should be free of sand, silt or grit. However, even in the best of packing practices, sand may be present in minute quantity in the product. Sand and similar material may be most easily detected in the bottom of the container after emptying the contents on the grading tray. Another means of detection for sand is by careful examination of the grading tray. Verification for suspected presence of sand is accomplished by rubbing the surface of the grading tray with a spoon. A "grating" feel or sensation indicates the presence of sand.

Normally, sand and grit would be noted in organoleptic checks for flavor, but this method cannot be relied upon due to the limited sample size. The recommended sample unit size for checking sand and grit is 900 g.

a. Place the sample in a No.8 sieve and immerse in a white bottom pan of water.

b. Agitate the celery to wash off any adhering sand.

c. Hold the screen over the white bottom pan to catch the wash water containing any remaining sand while spraying the celery with a fine spray of water.

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SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER LOT GRADING

SLICED OR CUT STYLE (continuation)

7. Sand and grit (continuation)

   d. Allow to settle for 2 minutes or longer if necessary.

   e. Decant 3/4 of the liquid.

   f. Repeat process (steps b through e above) until liquid is fairly clear.

   g. Decant the remaining water, being careful not to disturb the sand and grit that has collected in the corner of the bottom of the pan.

   h. Examine for presence of sand and grit:

      Grade A- minute amount that is hardly noticeable.

      Grade B- slight amount that is noticeable but not objectionable.

      Substandard- Objectionably affects appearance or edibility.

SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER LOT GRADING

DICED STYLE; CHOPPED STYLE

1. After the nonquality factors have been evaluated (net weight, vacuum, etc.) judge the sample unit (900 g or a container) for similar varietal characteristics. Unless there is a marked difference in varietal characteristics the product should not be downgraded for this factor. Do not be overly critical.

2. Evaluate the sample unit for the factor of brightness. Brightness means the extent that the overall appearance or eating quality of the mass of canned celery is affected by dullness from improper processing or any other cause.

   Canned celery which has a good characteristic bright appearance typical of the type of pack (canned salad or canned cooked) may be assigned a score of 18 to 20 points for U.S. Grade A. Canned celery which has a reasonably good characteristic bright appearance typical of the type of pack may be assigned a score of 16 or 17 points for U.S. Grade B. Canned celery that fails to meet the requirements for reasonably good brightness may be assigned a score of 0 to 15 points for Substandard.

3. Evaluate the color of the celery as a mass. Refer to the definitions in the U.S. standards and to Table I for proper scoring. "Good color" means canned celery color which is uniform in the range between green to white units, considering optional ingredients and the type of pack. Canned celery which has a good color may be assigned a score of 18 to 20 points for U.S. Grade A. "Reasonably good color" means canned celery color which lacks uniformity in the range between green to white units, considering optional ingredients and the type of pack. Canned celery which has a reasonably good color may be assigned a score of 16 or 17 points for U.S. Grade B. Canned celery that fails to meet the requirements for reasonably good color may be assigned a score of 0 to 15 points for Substandard.

4. Using the definitions in the U.S. standards and Table I, evaluate the sample unit for defects. Mechanical damage does not apply to the style of chopped.

5. Evaluate the sample unit for character. For canned salad celery, "good character" means celery which is uniform in texture and is practically free from coarse, stringy, or tough units. The celery units must be crisp and firm. Canned salad celery which has a good character may be assigned a score of 27 to 30 points for U.S. Grade A. "Reasonably good character" in

(See next page)

SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER LOT GRADING

DICED STYLE; CHOPPED STYLE (continuation)

5. Character (continuation)

canned salad celery means celery which lacks crispness and firmness but is reasonably uniform in texture. The celery is reasonably free from coarse, stringy, or tough units. Canned salad celery which has a reasonably good character may be assigned a score of 24 to 26 points for U.S. Grade B.

For canned cooked celery, "good character" means celery which is uniform in texture, practically free from coarse, stringy, or tough units and is pliable and tender but not soft. Canned cooked celery that has a good character may be assigned a score of 27 to 30 points for U.S. Grade A. "Reasonably good" character in canned cooked celery means celery which lacks uniformity in texture, is reasonably free from coarse, stringy, or tough units, and is lacking in pliability and tenderness and may be soft but not mushy. Canned cooked celery that falls into this classification may be assigned a score of 24 to 26 points for U.S. Grade B.

Canned salad celery or canned cooked celery that fails to meet the requirements for reasonably good character may be assigned a score of 0 to 23 points (Substandard).

6. Evaluate (taste and smell) the celery for flavor and odor. Grades A and B should have normal flavor and odor. Make flavor allowance for special packs, such as diet packs (packed without the addition of sodium salt). Also, be alert for off-flavor and odor due to de-tinning.

7. Evaluate the celery for presence of sand, silt or grit using the following procedure:

Celery, properly sorted, washed, prepared and processed should be free of sand, silt or grit. However, even in the best of packing practices, sand may be present in minute quantity in the product. Sand and similar material may be most easily detected in the bottom of the container after emptying the contents on the grading tray. Another means of detection for sand is by careful examination of the grading tray. Verification for suspected presence of sand is accomplished by rubbing the surface of the grading tray with a spoon. A "grating" feel or sensation indicates the presence of sand.

Normally, sand and grit would be noted in organoleptic checks for flavor, but this method cannot be relied upon due to the limited sample size. The recommended sample unit size for checking sand and grit is 900 g.

(See next page)

SUGGESTED ORDER OF GRADING A SAMPLE UNIT UNDER LOT GRADING

DICED STYLE; CHOPPED STYLE (continuation)

7. Sand and grit (continuation)

   a. Place the sample in a No.8 sieve and immerse in a white bottom pan of water.

   b. Agitate the celery to wash off any adhering sand.

   c. Hold the screen over the white bottom pan to catch the wash water containing any remaining sand while spraying the celery with a fine spray of water.

   d. Allow to settle for 2 minutes or longer if necessary.

   e. Decant 3/4 of the liquid.

   f. Repeat process (steps b through e above) until liquid is fairly clear.

   g. Decant the remaining water, being careful not to disturb the sand and grit that has collected in the corner of the bottom of the pan.

   h. Examine for presence of sand or grit:

      Grade A - minute amount that is hardly noticeable.

      Grade B - slight amount that is noticeable but not objectionable.

      Substandard - Objectionably affects appearance or edibility.

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